REMARKS

In the specification, the paragraph on page 8 and 9 has been amended to correct obvious translation errors reciting "electrode" instead of "electrolyte."

Claim 18 stands rejected under 35 USC 112, second paragraph, as being indefinite, for reciting "fuel comprises water and the dimethyl ether has a carbon number of 1 to 3." As the examiner points out the carbon number of dimethyl ether is known and fixed. This was an obvious translation error. Accordingly, claim 18 has been amended to correctly recite that it is the alcohol that has a carbon number of 1 to 3.

Claims 1-9, 12-14 and 16-17 stand rejected under 35 USC 102(b) as being anticipated by Cabasso. Claims 1-9, 12-14 and 16-17 stand rejected under 35 USC 102(e) as being anticipated by Prakash. Claims 1-11 stand rejected under 35 USC 102(b) as being anticipated by Campbell Campbell. Claims 1-14 and 16-17 stand rejected under 35 USC 103(a) as being unpatentable over Campbell in view of Cabasso. Claims 15 and 18 stand rejected under 35 USC 103(a) as being unpatentable over Cabasso in view of Muller. Claims 15 and 18 stand rejected under 35 USC 103(a) as being unpatentable over Campbell in view of Cabasso and further in view of Muller. Claim 18 stands rejected under 35 USC 103(a) as being unpatentable over Prakash in view of Muller. These rejections are respectfully traversed.

Claim 1, the only pending independent claim, has been amended to specify that polymer B is a cross linking polymer, this limitation was previously recited in dependent claim 8. Further, claim 1 has been amended to include the limitations previously recited in claim 2. No new matter has been added.

Claim 1 now recites that "the ratio of the amount of unfreezable water in the polymer electrolyte to the weight of the polymer electrolyte when dried, which is represented by formula (S2), is no less than 20% and no higher than 200%, wherein the content of unfreezable water (S2) =

(amount of unfreezable water in polymer electrode) / (weight of polymer electrolyte when dried) × 100 (%)." These limitations were previously recited in claim 2, which has been cancelled.

In the pending rejection the Examiner admits that the prior art does not expltitly disclose a polymer electrolyte with the claimed amount of unfreezable water (S1) and content of unfreezable water (S2). The Examiner, however, maintains that the "the amount of unfreezable water is inherently within the range disclosed by the applicant (as in claims 1 and 2), if the polymer blends used in the prior art reference are comprised from the polymer compounds disclosed by the applicant." This is incorrect.

As disclosed, for example, on page 5 of the specification, the Applicants have classified the water within the electrode. Specifically, the specification states:

> In the present specification, water in the polymer electrolyte is classified into bulk water, where the melting point is observed at a temperature of no less than 0°C, low melting point water, where the melting point is observed at a temperature of no higher than 0°C and no lower than -30°C, and unfreezable water, where the melting point is not observed at a temperature of no lower than -30°C. As a result of diligent research, the present inventors found that the ratio of unfreezable water significantly affects the performance of the polymer electrolyte.

Accordingly, the performance of an electrolyte is influenced not only by the amount in the electrolyte but also the "state of existence" of the water within the electrolyte. As explained in the specification page 8, line 35-page 9, line 7 "the polymer electrolyte of the present invention is a polymer electrolyte where proton conductive polymer (A) and polymer (B) that is different from (A) are mixed, and polymer (B) constrains the molecular chains of proton conductive polymer (A), and thereby, the amount of low melting point water and bulk water is suppressed, increasing the ratio of unfreezable water, and thus, it can be conceived that high proton conductivity and low fuel crossover can be achieved at the same time." Accordingly, the "state of existence" of the water within the electrolyte depends upon the selected amounts and combinations of polymers used in the electrolyte and would not simply be inherent to all polymers electrolytes including a polymer (A) and a polymer (B).

The prior art does not disclose a polymer electrolyte that has water with the claimed "state of existence," such that the claimed amount of unfreezable water (S1) and content of unfreezable water (S2) are satisfied. In fact, the prior art does not disclose unfreezable water at all. The prior art discloses only the amount of ordinary water in the electrolyte. Further, the prior art does not disclose the concept of using a crosslinking polymer (B) to constrain the molecular chains of proton conductive polymer (A) to increase the ratio of unfreezable water as claimed. Accordingly, the prior art does not disclose selecting the polymers and the amount of polymers in an electrolyte to satisfy formulas (S1) and (S2). Further, the prior art also does not suggest any reason to adjust the composition of the electrolyte to satisfy these claimed formula.

Finally, following is a table showing data from the Examples and Comparative Examples in the Specification. This table shows that the Examples that complied with the claimed amount of unfreezable water (S1) and content of unfreezable water (S2) had unexpectedly superior conductivity and suppression of fuel crossover than the Comparative Examples that did not comply with these formulas:

	amount of unfreezable water	content of unfreezable water	energy capacity (Wh)	fuel crossover
Example 1	42	43	1.9	
Comparative Example 1	49	***18***	***1.0***	***1.00***
Comparative Example 2	***22***	51	***0.7***	
Comparative Example 3	***38***	***15***	***1.1***	
Example 2	60	49		
Example 3	49	48	1.9	
Example 4	41	55		
Example 5	40	23		
Example 6	42	43		
Example 7	43	38	1.7	
Example 8	45	40	1.7	
Example 9	41	37	1.9	
Example 10	42	44	1.8	
Example 11	61	52	1.3	0.70
Example 12	63	48	1.4	0.50
Example 13	41	45	1.4	0.65
Example 14	58	49	1.4	0.65
Example 15	55	40	1.5	0.60
Example 16	86	50	2.9	0.22
Example 17	68	58	1.2	0.80
Example 18	59	54		0.76
Example 19	66	55		0.75
Example 20				0.62
Example 21	52	43		0.92
Example 22	68	58		0.83
Example 23	43	43		0.70
Example 24	41	45		0.60
Example 25	68	56	1.8	0.65
Example 26	47	50	1.9	0.71
Example 27	53	52	1.8	0.65
Example 28	54	54	1.4	0.80
Example 29	48	51	1.3	0.81
Example 30	44	56	1.2	0.85
Example 31	63	58	1.6	0.75
Example 32	55	50	1.5	0.79
Example 33	82	49	3.0	0.21
Example 34	86	50	2.7	0.22
Comparative Example 4	***28***	58		***1.82***
Comparative Example 5	***36***	54		***1.71***
Example 35	88	52		0.21
Example 36	81	47		0.32

Since the cited art does not disclose or suggest an electrolyte that possesses the amount of unfreezable water (S1) and content of unfreezable water (S2), the rejections of claims 1, and 3-18 should be withdrawn.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark Office determines that an extension and/or other relief is required, applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. **360842012600**.

Dated: January 20, 2011

Respectfully submitted,

By _____

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